



September 12, 2014

To: Seattle City Council
From: Barb Graff, Director, Office of Emergency Management
Assistant Chief A.D. Vickery, Seattle Fire Department
Subject: Response to Seattle City Council Resolution 31504 regarding Oil Trains

Seattle City Council requested as a part of Resolution 31504, "... that the Seattle Fire Department and Seattle Office of Emergency Management review and, if needed, update the City's incident response plans for the increasing risk imposed by the transport of petroleum by rail with a report back to the relevant committees of the City Council by June 20, 2014." This response has been drafted in partnership with the Seattle Fire Department, Mayor's Office of Policy and Innovation, Office of Intergovernmental Relations, Seattle Department of Transportation, and Councilmember O'Brien's office.

The Hazard

Over the last several years the region's transportation systems have become busier, more congested, more tightly interdependent and lacking in substantial reserve capacity. Disruptions in one part of the system can produce large consequences far from the site of the disruption. Two major rail freight carriers operate in Seattle – BNSF and Union Pacific. They each operate intermodal rail yards to support shipment of goods through the Port of Seattle. All the yards are located in large flat areas that are identified liquefaction zones, meaning during a major earthquake we can expect the land in the area to become liquefied.

The tracks run north and south through the City. From the Port of Seattle north, the tracks travel by Safeco Field and Century Link Field as well as the City's Emergency Operations Center and Fire Station 10 which houses the Hazardous Materials Unit. The tracks then travel through a tunnel under downtown Seattle and along Puget Sound through residential neighborhoods and parks. This route is particularly prone to winter landslides and storms coming off the Puget Sound. To the south, the tracks travel through the Duwamish Waterway and head inland until they pass Tacoma where they run along the Puget Sound. There are a number of major street arterial/rail crossings in the SODO district and Belltown areas. (Map attached)

The crude oil coming through Seattle is from the Bakken reserves in North Dakota. This crude oil is highly flammable and easily ignited at normal temperatures by heat, static discharges, sparks, or flames. Vapors may form explosive mixtures with air and may travel to sources of ignition and flash back.

Vapors may spread along the ground and collect in confined areas such as sewers and tanks. According to the U.S. Department of Transportation, areas up to one-half mile or more from an accident site are considered vulnerable. An incident requiring warning, evacuation or rescue could easily affect tens of thousands of people in densely populated sections of Seattle.

Several accidents involving crude oil transported by rail have in the last year resulted in death, injury, and substantial damage to property and the environment.

- On April 30, 2014, a 105-car unit train derailed in Lynchburg, VA causing a fire, the evacuation of 350 people, a spill of 30,000 gallons into the James River, and estimated damages of \$870,000.
- On December 20, 2013, a 106-car unit train collided with a derailed train car carrying grain near Casselton, North Dakota. Eighteen of the 21 derailed tank cars ruptured and approximately 400,000 gallons spilled and ignited. Approximately 1,400 people were evacuated and damages were estimated at \$8 million.
- On July 6, 2013, an unattended freight train in Lac-Megantic, Quebec rolled downhill, derailed, and the subsequent fires claimed the lives of 47 people. Approximately 2,000 people were evacuated from the surrounding area.
- On July 24, 2014, several tank cars derailed in Seattle under the Magnolia Bridge and though no product was spilled, it brought home the risk of catastrophe here in Seattle.

Seattle Disaster Readiness and Response Plan

The City of Seattle maintains one comprehensive all-hazard emergency plan titled the, 'Seattle Disaster Readiness and Response Plan (SDRRP).' It specifies direction and control at the field tactical level and assigns specific departmental responsibilities for consequence management. There are efficiencies and competencies that are better maintained through this comprehensive approach to emergency planning. For instance, some department must always be the lead agency in disasters – Public Health in pandemics, Police in civil unrest, SDOT in snow removal and infrastructure failures, SPU in water main breaks, and Fire in earthquakes and in this case train derailments which can result in fire and hazardous material release. However, the management of consequences such as the need to detour, evacuate, warn, shelter, transport, etc. are not dependent on the specific hazard. We may need to evacuate some portion of our population for a train derailment, a biological hazard, an earthquake, or an act of terrorism.

The City's Emergency Operations Center is activated to bring together all City Departments and external agencies affected by or able to provide support to the disaster response and relief efforts. This assures unity of effort, and the coordination of information, resources, plans and policy decisions. The mission of the EOC is always to provide support to the tactical level operations in the field and deal with any subsequent consequences of the emergency. A couple of examples illustrate the role of the EOC.

During snow storms, SDOT's mission is to keep critical routes throughout the City passable to traffic. The EOC assists in this mission by providing the public and stakeholders updated information on the response, ordering necessary supplies like tire chains for various department vehicles, redesigning emergency routes where necessary, or establishing shelter for those adversely affected by the storm.

In an earthquake, the Fire Department's mission early on is to assess where the worse damage has taken place and address immediate life safety concerns such as fire suppression, hazardous material control, rescue from collapsed structures, etc. The EOC assists in these missions by coordinating city-wide damage assessment, utility and infrastructure inspection and repair, providing shelter, and coordinating incoming response and relief services from the private sector and higher levels of government.

If the City experienced an oil train accident that resulted in fire and oil spill the Seattle Fire Department would be the lead agency according to the SDRRP. *"The plan designates a lead department for the various hazards Seattle is at risk for experiencing. A lead department is responsible for leading the tactical response in the field during an incident as contrasted with a strategic, City wide approach that is coordinated at the Emergency Operations Center. The lead department is also responsible for maintaining their assigned Emergency Support Function Annex, (in this case ESF-10, 'Oil and Hazardous Materials') and assisting with the update of Incident and Support Annexes as directed by OEM."* Using the federally mandated Incident Command System, other agencies would join the Fire Department in a Unified Command structure to achieve mutually agreed upon goals in the field – BNSF as the responsible party to mitigate the damage, Police to evacuate or protect the area, SDOT to reroute traffic, etc.

The Seattle Fire Department, in cooperation with BNSF, has traveled the rail corridor from Everett to Tukwila and developed three distinct response zones based on topography, access, and particular conditions:

- Industrial and Stadiums – access via surface streets and available firefighting water supply provide support in responding to incidents in this area;
- Great Northern Tunnel (King Street Tunnel) – the lack of fire/life safety systems in this tunnel presents significant challenges to response and mitigation;
- High Bluff/Waterside (from Myrtle Edwards Park north) – High banks, lack of land-side firefighting water supply and limited access due to the proximity of the Puget Sound complicate response.

Seattle Fire has developed specific tactical considerations for this type of incident and sends their hazardous materials technicians to specialized oil train response training at the National Rail Emergency Response Training Center in Pueblo, Colorado.

The Emergency Operations Center would activate to coordinate unity of city-wide effort focused on a set of objectives based on these priorities:

- Life safety
- Incident stabilization
- Property conservation
- Environmental protection

EOC activities would include public warning, stakeholder updates, provision of any logistical resources needed by field crews, coordination of multi-agency plans of action, resolution of any policy issues, activation of any necessary mutual aid agreements, evacuation and/or sheltering of displaced populations, coordination with hospitals and Public Health, etc. The EOC would host representatives of all City Departments capable of providing assistance in this type of incident such as Fire, Police, SDOT, SCL, SPU, HSD, FAS, and others as well as those agencies that oversee and manage rail traffic and environmental concerns such as BNSF, Amtrak, NTSB, Department of Ecology, etc.

All this said - an oil train accident that results in fire, explosion and/or spill would be a catastrophe for our community in terms of risk to life, property and environment, as well as risk to first responders and long-term economic consequences. It is also worth noting that the train tracks pass within a block of the City's Emergency Operations Center. For this and other practical reasons, OEM has agreements in place with a number of agencies whereby we could use some of their space as an alternate EOC location: University of Washington, any of the three Seattle College campuses, and the Gates Foundation.

On August 27th, Mayor Ed Murray and Matthew Rose, Executive Chairman of BNSF Railroad met to discuss the Mayor's growing concern with the rapidly increasing volumes of crude oil shipments through Seattle. BNSF has taken some small but important steps to make Seattle safer, such as changing schedules to avoid unit trains with hazardous materials and passenger trains from moving through the tunnel at the same time, and supporting training efforts of our first responders. But the rail tunnel beneath the city is antiquated and more must be done to mitigate the risk of an oil incident and improve the ability of our fire and rescue squads to effectively respond to a spill, fire, or explosion in the tunnel.

There are several other things BNSF can do immediately to make Seattle safer:

- Install a communications system in the tunnel, which would allow the use of radios.
- Install a fire and vapor suppression system in the tunnel designed to release water and foam.
- Install permanent ventilation system for use in evacuation, rescue, and fire suppression.
- Provide financial support for specialized response, clean-up, and mitigation training for our hazardous materials and public works spill response teams.
- Sponsor annual drills on responding to tank car emergencies.
- Provide a foam response vehicle to use for an oil train incident.
- Work with city departments on preparedness, response, and recovery planning as well as conducting a new security threat assessment for the BNSF rail corridor through Seattle.

BNSF has also been asked to join us and other cities across the state and region to ensure we are all doing everything possible to ensure the safety of our citizens.

In addition to the review of the City's response plans, we have considered other ways to help protect our population and environment.

Community Notification System

Many Seattle residential neighborhoods, business districts and our downtown core are in close proximity to rail road tracks and rail yards. If an accident occurs, emergency agencies must quickly be able to define the geographic area of risk, notify people in the area of the hazard and provide clear instructions on what actions to take to protect life and avoid injury. Today, the City has limited tools and may need to resort to the time consuming practice of going door-to-door to inform people of immediate dangers and to tell them to evacuate or shelter in place.

The City's existing Community Notification System (CNS) is outdated and involves a number of complicated procedures to initiate the warning. We are currently in the process of updating our CNS to allow for a more dynamic process in getting information out to individuals when the City experiences a major disaster.

Because of the complexity of procedures required for operating the current system, there are a limited number of staff at City operations and dispatch centers who are confident in their ability to initiate the warning successfully. The alerting function, in order to be effective, must be incorporated into real-time emergency procedures. There cannot be a time delay while qualified operators are located. The current system has rarely been used and relies on outdated technology presenting a single point of failure.

The Office of Emergency Management and the Finance and Administrative Services Department in collaboration with seven City Departments have prepared and issued a Request for Proposal to select a vendor to update our system and improve our alerting capability. The new system will provide a real-time mechanism to send the public information for taking immediate life protective measures and rapidly mobilizing emergency responders during events such as a train derailment with associated explosion, fire and release of dangerous materials. The expected service improvements include:

- Ability for the public to self-register multiple communication tools
- Increased reliability for timely and successful warning of public
- Ability to mobilize City responders during emergencies
- Ability to reach larger portions of the community within critical time constraints using multiple modes of communication including smart phones and social media.

Earthquake Early Warning System

By design, rail road tracks are typically laid in areas that do not have dramatic changes in elevation. In Seattle, this means that most of the tracks are laid in the flattest parts of the city; these are the very areas that are prone to liquefaction during major earthquakes. Liquefaction turns the soil into a type of

“quicksand” and will likely cause major damage to the rail lines. One of the mitigation strategies used in other jurisdictions has been to invest in an Earthquake Early Warning System. While not a panacea, an early warning system does provide some protections. These systems make communities safer by sensing earthquakes at their source and literally “radioing” ahead to say “seismic waves are coming.” Warnings can be used to safely and automatically halt transportation like trains and elevators. Warnings can be broadcast to the public to allow people precious seconds or minutes to ‘drop, cover and hold on’.

Early warning systems work best when the earthquake source is far away. They are uniquely suited to the Pacific Northwest because our area is subject to huge earthquakes centered offshore. These earthquakes are similar to the one that devastated northern Japan in 2011. An early warning system could provide coastal communities and the densely populated Puget Sound region up to five minutes lead time. Early warning systems are not a magic bullet for every kind of earthquake. If an earthquake happens right under Seattle the warning time might be only a few seconds, but even a few seconds allow a number of automatic actions to protect factories, critical lifelines, and computer systems. And for the region’s largest disaster risk, large offshore earthquakes, an early warning system makes a lot of sense. In the Pacific Northwest where rail lines travel over soils susceptible to earthquakes, an early warning system like those used in Japan to slow or stop their passenger trains would be a wise investment with benefits that mitigate more than just train accidents.

Public Education

Community disaster preparedness education is a critical factor in our overall ability to respond to and mitigate the impacts of any disaster. Preparedness at the neighborhood level means being connected to neighbors and able to help one another, having a plan for reuniting separated family members, and having basic supplies to see to your own needs. Preparedness at the business level means having a business continuity plan, educated employees, and practicing for potential relocation. Information to educate the public on the hazards we face are available on the Office of Emergency Management website, www.seattle.gov/emergency and maps of certain hazard elements are available on the Department of Planning and Development website, www.seattle.gov/dpd.

New Hazards Require Additional Response Resources

The Seattle Fire Department is the lead agency for hazardous materials response in the City of Seattle. A derailment and fire involving a Bakken oil tank car(s) would significantly stress the Department’s resources. Fires involving thousands of gallons of flammable liquid in a densely populated urban area require immediate access to specialized equipment and trained personnel to limit consequences.

There are actions which can be taken on the part of both BNSF and the City of Seattle which lessen the risk of a catastrophic incident, such as the installation of fire/life safety systems in the tunnel and limiting track speeds in high density urban areas.

The Seattle Fire Department needs funding support in procuring firefighting foam and equipment and specialized training for our personnel to deal specifically with oil train fires and emergencies. Crews in

the Seattle Department of Transportation and the Seattle Public Utilities Department would also benefit from additional research and training on how to deal with spilled crude oil when it enters the right-of-way and water, wastewater and drainage systems.

Federal Mitigation of Federal (but localized) Risks

In June of this year, the USDOT issued an emergency order requiring that railroads inform State Emergency Response Commissions about the movement of large shipments of crude oil through their states. The emergency order required that each railroad operating trains containing more than 1 million gallons of crude oil – the equivalent of about 35 tank cars, up to a mile long – from the Bakken region of North Dakota, Montana and parts of Canada provide information on the trains' expected movement, including frequency and county-by-county routes to the states they traverse. The order also requires that railroads disclose the volume of oil being transported and how emergency responders can contact at least one responsible party at the railroad. The State of Washington has shared that information with the Seattle Office of Emergency Management and the Seattle Fire Department and as a result we are aware that one to two trains travel through our community per day. Once refineries are able to accommodate additional shipments the number could potentially increase to three or more trains per day.

The federal government has primary jurisdiction to regulate railroad use and therefore has the most influence on mitigating the potential for tragic consequences associated with oil train accidents. In recent weeks, the USDOT has released a Notice of Proposed Rulemaking on enhanced tank car standards, a classification and testing program for mined gases and liquids, and new operational requirements for high-hazard flammable liquids. Concurrently, USDOT released an Advanced Notice of Proposed Rulemaking which seeks further information on expanding comprehensive oil spill response planning requirements for shipments of flammable materials. Multiple City Departments will be working with the Mayor's Office to review and submit comments on these proposed rules in the coming weeks.

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Rail Corridor Through Seattle

Legend

- High Occupancy Facilities
- Burlington Northern Railway Tunnel
- Railroads
- Rail Terminals
- Previous landslide locations
- Landslide Prone Slopes

Residential Population - Persons per Acre

- 0 - 10
- 10 - 21
- 21 - 42
- 42 - 74
- 74 - 173

0 0.5 1 2 Miles



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